NOTES FOR STUDENTS

Regeneration in mushrooms.—By a series of experimental studies on the regeneration phenomena in mushrooms, MAGNUS [11] has attempted to analyze the principles underlying the organization of the complex fruit-bodies of these plants. It was found that the cultivated mushroom, which was chiefly used in the experiments, possessed a marked capacity for regeneration, which varied with the age of the fruit-bodies and with the character of the tissues involved. In extremely young fruit-bodies, wounds caused by removing sections are quickly filled up by the growth of new tissue, but with increasing age this power of regeneration gradually disappears. The most extensive changes occur when a piece of the pileus in slightly older stages is removed by a perpendicular cut. The wound soon becomes overgrown with a sort of wound tissue, which is covered with an irregular hymenium consisting of sinuous lamellae or spines or irpex-like plates, all intermingled. The hymenium arises without reference to gravity, but it always originates in contact with the old hymenium and then gradually spreads over the normal tissue. Although the reticulations of the new hymenium arise without order, there appears a certain definite regularity in their relation to each other, so that whatever their form may be they always remain at definite distances from each other. It appears that the whole surface is capable of producing lamellae, but by some chance advantage certain portions start first, and these then exert an inhibiting influence over a given area and prevent the formation of new growing points, which would cause the lamellae to be too much crowded. In the normal expanding pileus the lamellae appear to be formed according to the same principles; for when the first-formed lamellae become separated by the growth of the margin of the pileus, new ones are interpolated among them, keeping the number per unit of space constant.

Besides the typical regeneration of parts, various tissues of the mushroom have the power of vegetative sprouting. In the youngest stages all hyphae return readily to a condition of vegetative growth; with increasing differentiation, however, this power is lost to a great extent. The palisade cells of the hymenium and the cells of the cortex soon lose their capacity for vegetative budding, although some of the cortical cells in the lower part of the stem later regain this power. In general it appears that the most highly specialized cells are the first to lose their capacity for returning to the vegetative condition. These facts argue in favor of a progressive differentiation of the hyphae which make up the fruit-body, and is opposed to the view that the character of the hyphae is largely determined by tropisms dependent upon their position in the fruit-body. If the character of the hyphae were merely a function of their position in the fruit-body, we should expect all hyphae to return readily to the vegetative stage. On account of this character of progressive differentiation toward a determinate form, the author regards the fruit-body of higher mushrooms as a definite entity, resembling in

[11] MAGNUS, WERNER, Ueber die Formbildung der Hutpilze. Archiv. für Biontologie 1:85–161. *pls. 8–13.* 1906.

this respect the animal body and differing thereby from vascular plants of indeterminate growth.

The paper is an excellent contribution toward the solution of the problem of the formation of the fruit-bodies of higher fungi by the correlated growth of apparently independent elements. The problem has been attacked from a new standpoint by a method which has shown a closer correlation of the different parts than has hitherto been demonstrated.—H. HASSELBRING.

Coastal plain vegetation.—R. M. HARPER'S studies of the vegetation of the coastal plain (BOT. GAZETTE **40**:392, 393. 1905) continue to appear in various journals. His most pretentious work, consisting of a phytogeographical sketch of the Altamaha Grit region of the coastal plain of Georgia, has been recently reviewed in this journal (**43**:225. 1907). This admirable paper should be read by all ecologists. The fulness of citation in the bibliography accompanying this work is most excellent, and may well be copied by authors generally; in addition to the exact citation of the original paper, citation is made of reviews of the paper cited, and a short appreciation of the article is given. In the *Bull. Torr. Bot. Club* (**32**:451–467. 1905) appear accounts of phytogeographical explorations in the coastal plain of Georgia in 1904, in which are noted interesting patches of mesophytic forests rather apart from the region where such forests dominate; also a peculiar case of a pine barren similarly isolated from the great pine barren region. In the same journal are accounts of new and noteworthy plants from the coastal plain of Georgia (**33**:229–245. 1906), notes on the distribution of some Alabama plants (**33**:523–536. 1906), and an account of a midsummer journey through the Carolinas and Virginia (**34**:351–377. 1907). In the latter paper mention is made of the remarkable flatness of the region, and a type of plant society, locally known as "pocosins," is described; a "pocosin" is a sort of heathlike swampy thicket of evergreen shrubs and scattered pines especially characteristic of the Carolinas.

In *Torreya* are several short articles, one of which gives a statistical method for comparing the ages of different floras (**5**:207–210. 1905), based on the idea that monocotyls develop dominantly in a region before dicotyls; the average of a number of local lists in glaciated and coastal regions gives about 30 per cent. of monocotyls; while similar lists in older regions have about 24 per cent. of monocotyls. In the Altamaha Grit region of Georgia, the relatively young pine barrens have 44 per cent. of monocotyls; while there are but 13 per cent. in the climax forests of the region. Other papers in the same journal give short studies in the North Carolina coastal plain (**6**:41–45. 1906), the Paleozoic region of Alabama, in which some new coastal plain plants are found (**6**:111–117. 1906), southeastern Mississippi and eastern Louisiana (**6**:197–205. 1906), the Altamaha Grit region of Georgia, giving additional notes on this region (**6**:241–246. 1906), and a Long Island cedar (i.e., Chamaecyparis) swamp (**7**:198–200. 1907).

In other journals are found papers on the coastal plain plants of New England (Rhodora **8**:27–30. 1906), the vegetation of Bald Knob, Elmore County, Ala-